

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year)  
18 October 2000 (18.10.00)

International application No.  
PCT/US00/02281

Applicant's or agent's file reference  
UA335PCT

International filing date (day/month/year)  
28 January 2000 (28.01.00)

Priority date (day/month/year)  
29 January 1999 (29.01.99)

## Applicant

HARRIS, Frank, W. et al

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

22 August 2000 (22.08.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Kiwa Mpay

Telephone No.: (41-22) 338.83.38

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

DEC 15 2000

To: RAY L. WEBER  
RENNER, KENNER, GREIVE, BOBAK, TAYLOR  
& WEBER  
1610 FIRST NATIONAL TOWER  
AKRON OH 44308-1456

## PCT

### NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing  
(day/month/year)

**11 DEC 2000**

Applicant's or agent's file reference

UA335PCT

#### IMPORTANT NOTIFICATION

International application No.

PCT/US00/02281

International filing date (day/month/year)

28 JANUARY 2000

Priority Date (day/month/year)

29 JANUARY 1999

Applicant

THE UNIVERSITY OF AKRON

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

EDDIE LEE

Telephone No. (703) 308-1690

*Renée G. J. Lee*

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference UA335PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/02281	International filing date (day/month/year) 28 JANUARY 2000	Priority date (day/month/year) 29 JANUARY 1999
International Patent Classification (IPC) or national classification and IPC IPC(7): H01L 23/58, 21/31 and US Cl.: 257/643; 438/780		
Applicant THE UNIVERSITY OF AKRON		

<ol style="list-style-type: none"> <li>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</li> <li>2. This REPORT consists of a total of <u>3</u> sheets.  <div style="margin-left: 20px;"> <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).            These annexes consist of a total of <u>0</u> sheets.         </div> </li> <li>3. This report contains indications relating to the following items:           <table style="margin-left: 20px; border: none;"> <tr> <td style="padding-right: 10px;">I</td> <td><input checked="" type="checkbox"/></td> <td>Basis of the report</td> </tr> <tr> <td>II</td> <td><input type="checkbox"/></td> <td>Priority</td> </tr> <tr> <td>III</td> <td><input type="checkbox"/></td> <td>Non-establishment of report with regard to novelty, inventive step or industrial applicability</td> </tr> <tr> <td>IV</td> <td><input type="checkbox"/></td> <td>Lack of unity of invention</td> </tr> <tr> <td>V</td> <td><input checked="" type="checkbox"/></td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>VI</td> <td><input type="checkbox"/></td> <td>Certain documents cited</td> </tr> <tr> <td>VII</td> <td><input type="checkbox"/></td> <td>Certain defects in the international application</td> </tr> <tr> <td>VIII</td> <td><input type="checkbox"/></td> <td>Certain observations on the international application</td> </tr> </table> </li> </ol>	I	<input checked="" type="checkbox"/>	Basis of the report	II	<input type="checkbox"/>	Priority	III	<input type="checkbox"/>	Non-establishment of report with regard to novelty, inventive step or industrial applicability	IV	<input type="checkbox"/>	Lack of unity of invention	V	<input checked="" type="checkbox"/>	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	VI	<input type="checkbox"/>	Certain documents cited	VII	<input type="checkbox"/>	Certain defects in the international application	VIII	<input type="checkbox"/>	Certain observations on the international application
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VII	<input type="checkbox"/>	Certain defects in the international application																						
VIII	<input type="checkbox"/>	Certain observations on the international application																						

Date of submission of the demand  22 AUGUST 2000	Date of completion of this report  17 NOVEMBER 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  EDDIE LEE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-1690 <i>Renee Pustan</i>

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/02281

**I. Basis of the report**

## 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:  
pages 1-42 , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages 43-51 , as originally filed  
pages NONE , as amended (together with any statement) under Article 19  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages NONE , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_
- ☒ the sequence listing part of the description:  
pages NONE , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/fig NONE

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\*Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/02281

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. statement**

Novelty (N)	Claims <u>1-25</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-25</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-25</u>	YES
	Claims <u>NONE</u>	NO

**2. citations and explanations (Rule 70.7)**

Claims 1-25 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest forming or using an insulating layer of the claimed polymerization product over an integrated circuit or over a conductive component.

----- NEW CITATIONS -----  
NONE

From the INTERNATIONAL SEARCHING AUTHORITY

MAY 12 2000

To: WEBER, RAY L.  
RENNER, KENNER, GREIVE, BOBAK, TAYLOR &  
WEBER  
1610 FIRST NATIONAL TOWER  
AKRON, OHIO 44308-1456

AMK  
**PGT**  
RENNER, KENNER, GREIVE,  
BOBAK, TAYLOR & WEBER  
NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

(PCT Rule 44.1)

Date of Mailing (day/month/year) 09 MAY 2000	
Applicant's or agent's file reference UA335PCT	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US00/02281	International filing date (day/month/year) 28 JANUARY 2000
Applicant THE UNIVERSITY OF AKRON	

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.
- Filing of amendments and statement under Article 19:**  
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):
- When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.
- Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35
- For more detailed instructions, see the notes on the accompanying sheet.
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.
3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Further action(s):** The applicant is reminded of the following:
- Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.
- Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).
- Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

N. DREW RICHARDS

Telephone No. (703) 306-6946

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To: WEBER, RAY L.  
RENNER, KENNER, GREIVE, BOBAK, TAYLOR &  
WEBER  
1610 FIRST NATIONAL TOWER  
AKRON, OHIO 44308-1456

Date of Mailing  
(day/month/year) **09 MAY 2000**

Applicant's or agent's file reference  
**UA335PCT**

**FOR FURTHER ACTION** See paragraphs 1 and 4 below

International application No.  
**PCT/US00/02281**

International filing date  
(day/month/year) **28 JANUARY 2000**

Applicant  
**THE UNIVERSITY OF AKRON**

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.  
**Filing of amendments and statement under Article 19:**  
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):  
**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.  
**Where?** Directly to the International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland  
 Facsimile No.: (41-22) 740.14.35  
**For more detailed instructions, see the notes on the accompanying sheet.**
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.
3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
  - ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
  - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Further action(s):** The applicant is reminded of the following:
 

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231  
Facsimile No. (703) 305-3230

Authorized officer  
**N. DREW RICHARDS**

Telephone No. (703) 306-8946

*(See notes on accompanying sheet)*

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/02281

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : H01L 23/58, 21/31

US CL : 257/643; 438/780

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/643, 642; 438/780, 781, 623, 99

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO APS EAST

search terms: polyimide, aromatic, diamine, dianhydride, fluoro

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,677,041 A (SMAYLING) 14 October 1997 (14-10-1997), col. 3-5, especially col. 4 lines 50-65.	1, 2, 12, 13, 23
A	US 5,766,740 A (OLSON) 16 June 1998 (16-06-1998), col. 3-4.	1-25
A	US 5,814,894 A (IGARASHI et al.) 29 September 1998 (29-09-1998), col. 5 and col. 15-16.	1-25
A	US 4,499,149 A (BERGER) 12 February 1985 (12-02-1985), col. 9-20.	1-25

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

21 APRIL 2000

Date of mailing of the international search report

09 MAY 2000

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

N. DREW RICHARDS

Telephone No. (703) 306-5946



# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

RECD 14 DEC 2000

Applicant's or agent's file reference UA335PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/02281	International filing date (day/month/year) 28 JANUARY 2000	Priority date (day/month/year) 29 JANUARY 1999
International Patent Classification (IPC) or national classification and IPC IPC(7): H01L 23/58, 21/31 and US Cl.: 257/643; 438/780		
Applicant THE UNIVERSITY OF AKRON		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  22 AUGUST 2000	Date of completion of this report  17 NOVEMBER 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  EDDIE LEE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-1690 <i>Renee P. Linton</i>

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/02281

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:  
pages 1-42, as originally filed  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages 43-51, as originally filed  
pages NONE, as amended (together with any statement) under Article 19  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages NONE, as originally filed  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_
- ☒ the sequence listing part of the description:  
pages NONE, as originally filed  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.  
These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/fig NONE

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\*Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/02281

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. statement

Novelty (N)

Claims 1-25 YESClaims NONE NO

Inventive Step (IS)

Claims 1-25 YESClaims NONE NO

Industrial Applicability (IA)

Claims 1-25 YESClaims NONE NO

## 2. citations and explanations (Rule 70.7)

Claims 1-25 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest forming or using an insulating layer of the claimed polymerization product over an integrated circuit or over a conductive component.

----- NEW CITATIONS -----

NONE



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b> <b>H01L 23/58, 21/31</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 00/45435</b> <b>(43) International Publication Date:</b> 3 August 2000 (03.08.00)
<b>(21) International Application Number:</b> PCT/US00/02281 <b>(22) International Filing Date:</b> 28 January 2000 (28.01.00) <b>(30) Priority Data:</b> 60/117,960 29 January 1999 (29.01.99) US <b>(71) Applicant (for all designated States except US):</b> THE UNIVERSITY OF AKRON [US/US]; 302 E. Buchtel Avenue, Akron, OH 44325 (US). <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> HARRIS, Frank, W. [US/US]; 1879 Deerwood Drive, Akron, OH 44313 (US). CHENG, Stephen, Z., D. [US/US]; 6123 Independence Drive, Hudson, OH 44236 (US). <b>(74) Agents:</b> WEBER, Ray, L. et al.; Renner, Kenner, Greive, Bobak, Taylor & Weber, 1610 First National Tower, Akron, OH 44308-1456 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> POLYIMIDES USED AS MICROELECTRONIC COATINGS		
<b>(57) Abstract</b> <p>The present invention provides an integrated circuit comprising an insulating layer comprising the polymerization product of the aromatic dianhydride 2,2'-bis(3,4-dicarboxyphenyl)hexafluoropropane dianhydride (6FDA) or the aromatic diamine 4,4'-diamino-2,2'-bis(trifluoromethyl)biphenyl (PFMB) with fluorine substituent-containing 4,4'-diamino-2,2'-disubstitutedbiphenyls and 2,2'-disubstituted-4,4',5,5'-biphenyltetracarboxylic dianhydrides, respectively. The present invention further provides a method of coating an integrated circuit comprising preparing a polyimide in an organic solvent, applying the polyimide dispersed within the organic solvent to the surface of the integrated circuit forming a thin insulating layer or film on the surface of the circuit; and heating the integrated circuit with the insulating polyimide layer or film disposed thereon to a temperature sufficient to evaporate the organic solvent and to cure the polyimide. The 6FDA-based and PFMB-based polyimide films of the present invention possess low dielectric constants, high coefficients of thermal expansion, excellent thermal stability and excellent solubility in conventional organic solvents.</p>		

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/02281

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H01L 23/58, 21/31

US CL :257/643; 438/780

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/643, 642; 438/780, 781, 623, 99

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO APS EAST

search terms: polyimide, aromatic, diamine, dianhydride, fluoro

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,677,041 A (SMAYLING) 14 October 1997 (14-10-1997), col. 3-5, especially col. 4 lines 50-65.	1, 2, 12, 13, 23
A	US 5,766,740 A (OLSON) 16 June 1998 (16-06-1998), col. 3-4.	1-25
A	US 5,814,894 A (IGARASHI et al.) 29 September 1998 (29-09-1998), col. 5 and col. 15-16.	1-25
A	US 4,499,149 A (BERGER) 12 February 1985 (12-02-1985), col. 9-20.	1-25

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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